



Cat. No. 19

REPORT
OF THE
PROCEEDINGS
OF THE
FIFTEENTH ANNUAL BLISTER RUST CONFERENCE
HELD IN
Warrensburg, New York, Oct. 31 to Nov. 2, 1929.

PROGRAM

ANNUAL BLISTER RUST CONTROL CONFERENCE

WARRENSBURG, NEW YORK - EVENING OCTOBER 31 TO NOVEMBER 2, 1929

October 31st

6:30 P.M. - Dinner - Hotel Adirondack, Warrensburg, New York.

7:30 P.M. - General Meeting - Hotel Adirondack, Warrensburg, New York.

Chairman - Mr. W. O. Filley, Forester, Conn. Agri. Experiment Station.

Address of Welcome and Talk on Forestry in New York

Mr. W. G. Howard, Superintendent of Forests, New York Conservation Dept.

Pruning and Weeding - illustrated with slides

Mr. A. C. Cline, Assistant Director, Harvard Forest, Petersham, Mass.

November 1st

8:00 A.M. - Inspection of Field Conditions.

Pack Forest - under direction Mr. C. H. Foster, Director, Pack Forest.

Ribes Ecology - under direction Mr. A. E. Fivaz, Office of Blister Rust Control.

1:30 P.M. - General Discussion of Blister Rust Control Problems.

Spread of disease, status of control work, effectiveness of control, black currant eradication, nursery sanitation, re-eradication, etc. - Administration Building, Pack Forest, Warrensburg, New York.

7:30 P.M. - Smoker: Bring Your Pipe and Pet Topics.

Mr. H. E. Allanson, Assistant Chief of U. S. Bureau of Plant Industry, will discuss "Administrative Relations" - Administration Building, Pack Forest, Warrensburg, New York.

November 2nd

8:00 A.M. - Inspection of pine areas, blister rust damage, and effectiveness of control - under direction Mr. H. L. McIntyre, Supervisor, Forest Pest Control, New York Conservation Department.

2:00 P.M. - Inspection of other tree diseases - under direction of Dr. H. H. York, Forest Pathologist, New York Conservation Department.

CONTENTS

<u>Foreword</u>	<u>Page</u>
<u>October 31</u>	
Opening remarks by W. O. Filley, Chairman	5
Remarks by W. O. Howard and N. C. Brown	5
Address by A. C. Cline	5
<u>November 1</u>	
<u>Morning session</u> - In the field	6
Infection plots	6
Ecology plots	8
<u>Afternoon session</u> - Administration Building Pack Forest	10
Spread of the rust	10
Conditions in the West	11
Blister Rust Control in the Eastern States	11
State Summaries	
Maine	17
New Hampshire	17
Vermont	18
Massachusetts	19
Rhode Island	19
Connecticut	20
New Jersey	20
New York	21
Pennsylvania	22
Michigan	23
Wisconsin	24

Minnesota	24
Western States	25
Discussion	27
Effectiveness of Control	27
Nursery Sanitation	29
Re-eradication	30
<u>Evening session</u> - Administration Building Pack Forest	31
Exhibit Material	31
White Pine Weevil Control	32
Administrative Relations	32
Remarks by R. L. Morgan and S. B. Detwiler	33

November 2

<u>Morning session</u> - In the field	34
Trip through the Pack Forest	34
<u>Afternoon session</u> - In the field	35
Tour through the James Plantations - Glens Falls, N. Y.	35
<u>Report</u> by A. E. Fivaz on Growth of White Pine on the Starbuck Lot, Chestertown, N. Y.	37
<u>Resolutions</u>	44
<u>Attendance List</u>	47

FOREWORD

This record of the proceedings of the Annual Blister-Rust Control Conference, held in Warrensburg, New York on October 31 to November 2, 1929, is somewhat of a departure from the proceedings as recorded in the instance of previous conferences. The 1929 conference was designed especially as a field meeting, with but one prepared address, and for that reason not adaptable to a formal recording of the procedure. On the following pages, however, an attempt has been made to mention some of the highlights; to record brief summaries of the reports from the cooperating States; and to include abbreviated field data relating to the demonstration plots visited during the sessions of the conference.

October 31

Opening session 8:00 P.M. Adirondack Hotel

Chairman: W. O. Filley, Forester of the Connecticut Experiment
Station

The 1929 Blister-Rust Control Conference convened on the evening of October 31, at the Hotel Adirondack, Warrensburg, New York with nearly 100 in attendance, including several pathologists, foresters, and entomologists, in addition to the Blister-Rust personnel.

The conference was officially opened by Mr. W. O. Filley as Chairman. Mr. Filley, as one of the delegates to the first Blister Rust Control Conferences in the United States, fittingly referred to the progress that had been made in the practice of control measures; to the intelligent and helpful interest manifest by the general public; and stressed in particular, the fact that while much has been attained in the initial control work, there still remains the problem of maintaining adequate Ribes-free conditions through periodic control work, in order to insure the protection of the stands of white pine in the Northeast.

After these introductory remarks, Mr. Filley introduced Mr. W. G. Howard, Superintendent of Lands and Forests of the New York Conservation Department. Mr. Howard extended the welcome of the State of New York, and placed the facilities of his department at the disposal of the delegates. Mr. Howard also briefly outlined the plans of his department formulated to carry out the extensive program of forestry called for by recent legislation in New York State, for which appropriations have been approved.

Mr. Howard was followed by Professor N. C. Brown, acting dean of the New York State College of Forestry. Professor Brown was pleased to extend to the Conference the facilities of the Pack Demonstration Forest, and specifically to make available the services of the Director, Mr. Clifford Foster and the use of the Administration Building on the Forest. Prof. Brown described in interesting fashion the purchase of the Pack tracts and outlined in brief what it is hoped may be accomplished upon the Demonstration Forest.

These informal and extemporaneous talks were followed by the feature of the first session of the conference; namely, an illustrated talk on the subject "PRUNING AND WEEDING" by Mr. A. C. Cline, Assistant Director of the Harvard Forest in Petersham, Massachusetts. As this subject has been so adequately covered in the two bulletins* issued jointly by the Harvard Forest and the Massachusetts Forestry Association, a detailed account of Mr. Cline's talk is not included in this report. The extended discussion which followed Mr. Cline's talk was indicative of the interest stimulated. The talk was profusely illustrated by a series of very interesting lantern slides, the photographs largely taken on the Harvard Forest at Petersham.

*PRUNING FOR PROFIT - As Applied to Eastern White Pine - A. C. Cline
& E. D. Fletcher - 1928

*FOREST WEEDING -- With Special Reference to Young Natural Stands in Central New England - A. C. Cline.

Following Mr. Cline's paper, the members were privileged to have a showing of a series of motion pictures, loaned for the occasion by Dr. E. W. Brandes of the Bureau of Plant Industry and relating to a recent trip taken by Dr. Brandes in Borneo.

Adjournment for the day was taken at a late hour.

Friday, November 1

Morning session: In the field

Although weather conditions were far from ideal, the program for demonstrations in the field was carried out to the last detail as planned under the efficient guidance of Mr. H. L. McIntyre of the New York Conservation Department and Mr. A. E. Fivaz of the Office of Blister Rust Control, who lead a convoy of about twenty automobiles.

This first field tour had for its purpose, (1) the demonstration of damage already caused by the rust in white pine stands of various ages, types, and mixtures; (2) the effectiveness of Ribes eradication, and (3) visits to ecology plots. The infected trees were painted, tagged, or otherwise marked in order to give a quick picture of conditions.

Peterson Plantation:

This plantation of white pine was made about 1907 on a hayfield. Eradication work was delayed until 1927, when gooseberries were located in the stone walls, near stone piles, and on the road right-of-way which adjoins the plantation on one side. In October, 1929, a plot one square acre in size was laid out along the roadside edge of this plantation. The trees on this plot were pruned of laterals to a point about eight feet from the ground and carefully examined (by climbing) for blister rust. Trees found to be seriously infected were marked with white paint so as to be instantly visible. In taking the data, trees were classed as "killed by blister rust", "will die", "may die", and "healthy". The "will die" group includes only those trees with stem cankers or active branch cankers very near the stem, while trees with branch cankers which had a chance to reach the stem but were not sure to do so, were classed as "may die". The "healthy" group includes not only the uninfected trees but also the infected ones with dead cankers or with branch cankers that had no chance to reach the stem. Trees dead from causes other than blister rust included one 1-inch, one 2-inch, three 3-inch, and three 6-inch (D.B.H.) individuals, which will not be further considered. The data taken on the one-acre plot are given in Table 1:

Table 1. - Pine infection study data taken October 16, 1929, on one-acre sample plot in Peterson Plantation, near Warrensburg, New York, by S. B. Detwiler and A. E. Fiyaz.

D.B.H. (Inches)	Number of dominant, codominant, and intermediate trees						Number of suppressed trees						Total number of all Trees
	Infected with B.R.						Infected with B.R.						
	Dead	Will Die	May Die	Total Seriously Infected	Healthy	Total Trees in Crown Class	Dead	Will Die	May Die	Total Seriously Infected	Healthy	Total Trees in Crown Class	
1	0	0	0	0	3	3	4	2	0	6	31	37	40
2	4	3	0	7	20	27	3	3	0	11	69	80	107
3	4	30	4	38	62	100	0	21	1	22	57	79	179
4	8	47	18	73	112	185	1	11	2	14	25	39	224
5	1	66	25	92	119	211	0	2	0	2	7	9	220
6	0	42	12	54	52	106	0	0	0	0	2	2	103
7	0	12	9	21	26	47	0	0	0	0	0	0	47
8	0	4	1	5	9	14	0	0	0	0	0	0	14
9	0	3	3	6	0	6	0	0	0	0	0	0	6
10	0	0	0	0	1	1	0	0	0	0	0	0	1
All	17	207	72	296	404	700	8	44	3	55	191	246	946

Of the 700 trees in the dominant, codominant, and intermediate crown classes, 17 or 2.4 per cent have been killed, 207 more or 29.6 per cent will surely be killed, and 72 or 10.3 per cent may be killed by the blister rust, totaling 296 trees that are seriously infected, or 42.3 per cent of all the trees in these crown classes on the plot. Of the 246 suppressed pines on the acre, 8 or 3.3 per cent have been killed, 44 others or 17.9 per cent will surely be killed, and 3 or 1.2 per cent may be killed by the disease, comprising a total of 55 trees that are seriously infected, or 22.4 per cent of all the suppressed trees. Of the 55 seriously infected trees classed as suppressed 14.5 per cent have been killed while only 5.7 per cent of the seriously infected trees in the better crown classes have been killed by blister rust. This comparison shows that suppressed trees succumb more quickly to the disease than do the trees with better crowns. However, only 22.4 per cent of the suppressed trees are seriously infected, while 42.3 per cent of the trees with better crowns are seriously attacked.

The dominant, codominant, and intermediate trees averaged 4.70 inches in diameter at breast height, the suppressed trees 2.63 inches, and all the trees, regardless of crown class, 4.17 inches. Assuming for the sake of convenience that the first of these average diameters is 4.50 inches, of the 315 dominant, codominant, and intermediate trees below the average in diameter, 118 or 37.5 per cent are seriously infected, while 178 or 46.2 per cent of the pines in these crown classes with greater-than-average diameter are so classed. It is evident that not only are the trees in the better crown classes more apt to become seriously diseased, but also that the larger trees within the crown class are more apt to become seriously infected.

Tyrell Plot:

This lot supports a splendid natural reproduction of white pine which followed logging. The trees are very heavily diseased with blister rust; the Ribes having remained on the area until 1927. The infected pines on a half-acre sample plot were tagged and gave a very striking impression of the seriousness of the disease, particularly in the younger age class of natural pine.

Backus Place:

The Ribes on this area were eradicated in 1918. A half acre on the area when compared with the Tyrell Lot, shows the effectiveness of control work in preventing damage to white pine by the blister rust. Very few cankers could be found on the Backus plot, and these center about a few gooseberries which have grown up since the 1918 eradication.

Hackensack Mountain Ecology Plots:

The plots are located in a white pine stand that seeded in naturally about 75 years ago. Excellent advance reproduction occurs along the southern edge of the stand, where considerable light reaches the forest floor. The volume of the stand in 1927, based on a plot about 1/5 acre in size and located on the eastern slope of the ridge, was determined to be 63,751 B.F. per acre, using the volume table for southern New Hampshire white pine reprinted in the "Woodsman's Handbook".

Four Ribes ecology plots were laid out in this stand in 1927. The Ribes on these plots were carefully located, removed, and measured, and the forest cover was also carefully studied. These plots are units in a series of 115 ecology plots studied in an effort to determine the influence of the forest cover on the Ribes population.

One of these four plots was also used to determine if viable Ribes seeds were lying dormant in the forest floor, and if so, at what depth they occurred. This plot, 90 by 100 feet in size, was divided into nine strips each 10 by 100 feet in size. Five alternate strips were treated and four were left untreated as checks. The treatment ranged from the complete removal of all the organic portion of the forest floor from one strip to a slight disturbance of the organic layers without removal on another strip. One year after treatment Ribes seedlings at the rate of 1,394 per acre were found wherever the lowest duff layer had been thoroughly exposed. The results of the experiment showed that:-

1. Viable Ribes seeds were lying in the lowest duff layer, 1 1/2 to 2 1/2" below the surface of the forest floor.
2. Thorough disturbance exposing this lowest duff layer was necessary to cause general germination of these seeds.
3. General germination of these seeds occurred as a result of the forest floor disturbance without any change in the dense forest canopy overhead.

It is probable that the Ribes seedlings resulting from this disturbance grew from seeds that had been lying dormant in the forest floor for many years, perhaps 40 years or more.

Burn Ecology Plots:

These plots are on an area from which mature and sub-mature white pine was lumbered, beginning in 1923. Before the operation had been completed on May 13, 1925, fire broke out near the saw mill, swept the slash, killed all the reproduction left by the logging, and developed into a crown fire in the nearby stands of conifers. So thorough was the fire that not a green thing remained on the area. The owner planted most of the burn with white pine in the fall of 1925. The logging and the fire exposed Ribes seeds, which had been lying deep in the forest floor, to conditions favorable for germination, and as many as 338 gooseberry seedlings per acre were present on this area in 1927. These Ribes plants have not been removed except on the ecology plots, and already the planted pine is showing the effect of the blister rust as spread from these young Ribes seedlings. Two ecology plots, one on each side of the trenches where the fire was stopped, show a striking contrast between the burned and unburned pine sites. In 1927 the unburned plot had only 44 Ribes per acres, most of them resulting from the logging disturbance; while the burned plot had 338 Ribes per acre.

Fire may be very effective in producing conditions favorable for the germination of Ribes seeds lying in the forest floor. The effect of fire in

delaying the next crop of white pine is also demonstrated by these companion plots. In the unburned plot there is a good stand of advance reproduction, making rapid height growth since its release by the lumbering of the mature stand, while no natural regeneration is as yet noticeable on the burned plot.

The effect of the Ribes seedlings that sprang up following the logging and the fire on the pine that was subsequently planted on this burn was demonstrated by a small sample plot selected for this purpose. This plot, 1/10th acre in size had a total of 103 small pines, all planted, of which 9 were visibly diseased by blister rust. The diseased pines and the 13 gooseberry bushes on this plot were tagged for demonstration purposes.

Afternoon session: Administration Building, Pack Forest

Chairman: Mr. T. J. King, Blister Rust Agent for Merrimack County,
New Hampshire

The recently completed headquarters building of the Pack Demonstration Forest, an attractive cabin conveniently located along the main highway and nestling in a stand of white pine, served as a most appropriate meeting place for the indoor sessions of the conference. On this particular occasion, with the weather not particularly agreeable, the blazing logs in the attractive fireplace in the cabin, added not a little to the comfort of the members in attendance.

Topic: SPREAD OF THE RUST:

The 1929 conference was not only a departure from the usual procedure, but it was noteworthy in that there were in attendance more new faces than on any previous occasion. These men in particular were from states where the importance of blister rust is just beginning to be appreciated; and where preparations are being made to carry on with increased energy the program of control through the eradication of Ribes. Among the new members present, especial mention is made here of H. E. Clepper, State Leader of Pennsylvania, P. B. Mott, State Leader of New Jersey, and E. C. Mandenberg, State Cooperator for Michigan.

In greeting the conferees, Mr. Mandenberg gave a very friendly and interesting talk descriptive of the blister-rust mindedness of the people of the State of Michigan. Mr. Mandenberg pointed out how his people were appreciative of the problem, but that they needed to be shown. He also indicated the magnitude of the problem in Michigan resulting from the size of the area involved, and the present condition of forest depletion. Mr. Mandenberg referred to the preliminary measures already adopted in Michigan; namely, school surveys to locate centers of infection on Ribes, and black currants in particular; nursery sanitation; eradication of black currants in sections where the rust has already made its appearance; and scouting for infection on white pine. The gist of Mr. Mandenberg's talk may be summarized by saying that Michigan is already an active cooperator and is most willing to be shown.

As another new member of the conference, Mr. Clepper, State Leader of Pennsylvania, expressed to the membership in a few well chosen words, his appreciation of the assistance already rendered to him by the personnel of the blister-rust control organization through helpful suggestions and demonstrations of blister-rust infection and control methods. Mr. Clepper described briefly the recent spread of the rust in Pennsylvania, and outlined the plans for the inauguration of more intensive scouting and the undertaking of control work in the Keystone State.

Mr. Mott, of New Jersey, informed us that native white pine is only very scattering in that State and of relatively little commercial value. For that reason, control work in New Jersey has been confined so far to ornamental plantings.

Topic: BLISTER RUST CONDITIONS IN THE WEST:

Mr. G. B. Posey, of the Washington Office of Blister Rust Control, briefly described the major changes in rust conditions in the western states, informing us that additional areas of pine infection had been discovered during 1929 in Idaho and western Oregon. The conditions in the West as a whole, were described by Mr. Posey as - heavy and general in western British Columbia - medium in western Washington and Oregon - and light in Idaho, northern Oregon and eastern Washington.

In the discussion following Mr. Posey's remarks and in specific reply to an inquiry from Mr. Mandenberg, the point was made that the rust is already killing the larger pines in the western region, and that one area in particular in the coastal region of British Columbia, resembles the conditions in the East as found in the Waterford, Vermont infection area.

Topic: BLISTER RUST CONTROL IN THE EASTERN STATES

Mr. E. C. Filler, of the Office of Blister Rust Control, gave an interesting description of general conditions affecting blister-rust control in the Eastern States. His talk was augmented by several enlarged maps of New England and New York showing the distribution and amount of white pine, Wild Ribes, blister-rust infection and protection areas. A summary of Mr. Filler's remarks follow.

The white pine growth in New England and New York covers approximately 8 1/4 million acres, nearly equally divided into three classes: pure pine, mixed pine and pine restocking in other types than pine. In the Lake States and Pennsylvania, a rough preliminary survey shows a total of 1,730,461 acres of white pine growth. However, only 597,910 acres of this amount contain pure pine or mixed pine above thirty percent. In addition, throughout the Northeastern and Lake States, there are vast areas of mixed growth with pine stocking of less than 20 percent. In New Jersey, the white pine is confined to ornamental and forest plantings and to small scattered areas of natural growth in the northern part of the State.

Wild Ribes occur more or less generally distributed throughout the white pine region, but vary locally as to site, species, size and abundance. Nine indigenous species have been encountered in the eastern control work, four being gooseberries and five currants, exclusive of Ribes vulgare, which is considered as an escaped cultivated red currant. In certain sites, the

Ribes number 100 or more per acre, and in others are few or entirely absent. The aggregate, however, represents many millions of such bushes, as evidenced by 75,010,046 wild Ribes being eradicated in New England and New York during the period from 1918 to 1929 inclusive. The cultivated Ribes problem is indicated by the 529,255 cultivated bushes destroyed during this same period.

Blister rust infection is general throughout the commercial range of white pine in the Northeastern and Lake States. Over extensive areas from 1 to 20 percent or more of the white pine are infected and in many local tracts from 50 to 100 percent of the trees are dead or dying. The amount of disease varies considerably in different localities and is directly affected by such factors as the number of original infection centers caused by the planting of imported diseased pine, the distribution and amount of native pine, association of pine and Ribes, abundance of Ribes, climatic conditions, and the application of control measures. The cartographical survey maps show a direct correlation between pine infection and abundance of Ribes. In Essex and Warren Counties, New York, and in the upper Connecticut River Valley region where Ribes are generally plentiful, pine infection is also heaviest, 11 to 20 percent, or more, of the trees being diseased. In southern New England and in most of southern New York, less than one percent of the pines are infected, except in a few limited areas. The disease has been established in Pennsylvania and the Lake States about as long as in the New England States and New York, but due chiefly to fewer importations of infected stock and localization of native pine areas, it has not developed and spread as rapidly as in the latter section. However, during recent years, the amount and extent of the disease in Pennsylvania and the Lake States has increased at an alarming rate, showing the urgent need for the general application of control measures.

During the experimental control work in New England and New York, from 1918 to 1921 inclusive, 1,036,903 acres were cleared of 14,399,785 wild Ribes and 91,718 cultivated bushes at an average cost of 37.6 cents per acre. The cost per acre was reduced from 72 cents in 1918 to 18 cents during 1921. In the application of control measures during the present program, from 1922 to 1929 inclusive, an additional area of 6,720,237 acres was cleared of 60,393,332 wild Ribes and 437,537 cultivated bushes at a per acre cost of 17.8 cents. This acreage, however, includes 481,899 acres reworked since 1923. Therefore, up to 1929 inclusive, cooperative control work had actually been conducted on a total of 7,275,241 acres (pine areas and protection zones) on which 75,322,372 Ribes had been destroyed. This does not include a few thousand acres worked in connection with strictly Federal projects. In conjunction with the regular control work, measures are also being taken to protect white-pine nursery stock and plantings and to eliminate Ribes nigrum from the white-pine region. The public participation in control work during the period from 1922 to 1929 is indicated by 30,023 individual cooperators expending \$394,098.26, and by 1175 town appropriations totalling \$333,180.80. These individuals actually furnished labor or money to eradicate the Ribes on their properties. Also, thousands of additional owners permitted the destruction of their cultivated bushes without compensation. The excellent public support in this respect is evidenced by the fact that although 437,537 cultivated Ribes were destroyed in the regular control work and 26,451 in connection with special black currant and nursery sanitation projects, during

the period 1922 to 1929 inclusive, yet it was only necessary to compensate 1050 owners \$8,849.29 for 24,755 bushes. In other words, based on the total number of cultivated Ribes eradicated, compensation was paid for only 5.3 percent of the total bushes and averaged 1.9 cents per bush. In addition to the above direct cooperation, thousands of individuals gave their general support and personal aid to the control program.

These splendid accomplishments are the result of successful educational and service activities. The former are necessary to create general and favorable attention, interest and desire; the latter are essential to secure general, prompt, and effective cooperation in applying control measures by individuals and towns. The amount of this work conducted by the blister-rust control agents in New England and New York during 1922 to 1929 inclusive is as follows:

Education

Exhibits Placed	4,404	Publications distributed ...	491,466
Items published	8,378	Posters and signs placed ...	58,514
Meetings addressed	3,831	Field demonstration meetings	2,966
Attendance	274,084	Attendance	27,507

In addition, thousands of mimeographed articles have been distributed, many roadside demonstrations placed, infected trees tagged, radio talks given, etc.

Service

Initial interviews ...	100,684	Individuals instructed in the	
Follow-up calls	52,328	disease	39,256
		Individuals instructed in con-	
		trol methods	24,279

The results accomplished in Ribes eradication work in the Eastern States during 1929 were most gratifying. These accomplishments are summarized in the following table.

Summary of Ribes Eradication Work in Eastern States During 1929
(Initial and Re-Eradication Work)

		Cooperative Work in New England and New York	Cooperative Work in Pennsylvania, Michigan, and Wisconsin	Federal Control	Total (all eradication work)	Percent + or - over 1928
No. cooperating towns		156	2	0	158	+ 3.3
No. individual cooperators		4,369	19	0	4,388	- 0.05
Acreage of initial eradication		738,263	7,648	3,283	799,194	+ 4.0
Acreage of re-eradication		131,492	100	0	131,592	+ 1.6
Total acreage worked		919,755	7,748	3,283	930,786	+ 5.6
Wild Ribes destroyed		7,262,127	496,376	102,061	7,860,564	+ 14.9
Cult. Ribes destroyed		74,654	944	83	75,681	+ 29.4
Cost	Individuals	\$50,449.29	\$170.00	-	50,619.29	- 7.5
	Towns	41,323.23	199.50	-	41,522.73	+ 5.1
	States	76,827.92	6,950.10	-	83,778.02	+ 74.7
	Gov't	2,694.11	617.04	1,746.74	5,057.89	+ 50.7
	Total	\$171,294.60	\$7,936.64	\$1,746.74	180,977.98	+ 13.3
Cost per acre		\$.136	\$ 1.02	\$.532	\$.195	+ 7.7
Ribes per acre		7.9	64.1	31.1	3.46	+ 9.0

Note: This summary does not include special black-current projects in Massachusetts, Rhode Island, New York and Michigan. In connection with this work, 11,699 cultivated bushes were destroyed in the first three States and in Michigan 5,194 Ribes nigrum were eradicated. An additional 1,235 cultivated bushes and 720 wild Ribes were pulled in conducting nursery sanitation projects in Mass. No acreage figures are available for these projects. The federal expenditures were for Ribes scout work.

Status of Blister-Rust Control in Eastern States - December 31, 1929.

New England and New York

<u>State</u>	<u>Total Acreage cleared of Ribes 1918 to 1929 inclusive (Excluding re-eradication)</u>	<u>Total acreage still needing initial control work (a)</u>	<u>%Total control area cleared of Ribes</u>
Maine	2,381,142	593,457 (b)	80.0
N. H.	2,188,771	598,668	78.5
Vt.	164,040	135,623	54.7
Mass.	1,608,185	148,730	91.5
R. I.	272,682	250	99.9
Conn.	200,788	32,167	86.1
N. Y.	<u>459,635</u>	<u>468,816</u> (c)	<u>49.5</u>
Totals	7,275,241	1,977,711	78.6

(a) This area is based on estimates, made by the blister-rust control agents, of the remaining acreage still in need of initial Ribes eradication in the various towns of their districts. It includes both pine areas and protection zones.

(b) Outside the agents' districts in Maine and east of the Penobscot River, there are an additional 411,871 acres of mixed growth with a stocking of 20 percent or more white pine. Some of this pine may require protection.

(c) Outside the agents' districts in New York, there are an additional 132,301 acres containing principally white pine plantations and mixed natural growth with a stocking of 20 percent or more white pine. No information is available as to how much of this acreage will need eradication of Ribes.

Pennsylvania and Lake States

State	Year control work performed	Total acreage cleared of Ribes 1913 to 1929 incl. (Excluding re-eradication)	Acreage of White Pine Growth*			Total
			Pure Pine (30% or more pine)	Mixed Pine (20-79% pine)	Pine restocking in types other than pine	
Penn.	1929	4,877	91,897	126,101	157,630	375,628
Mich.	1928 & 1929	4,070	28,321	685,789	122,769	836,879
Wis.	1913 to 1929	30,263	11,127	109,756	negligible	120,883
Minn.	1913 to 1922	4,931	173,092	266,812	170,524	610,428
Totals	-	44,165	304,437	1,133,458	450,923	1,945,813

*The acreage of white pine growth is based on a rough preliminary survey made in these states by the Office of Blister Rust Control during 1927 and 1928. In addition to the acreage listed, there is a vast area of mixed growth with pine stocking of less than 20 percent.

Following Mr. Filler's statement, each state leader gave a summary of control work in his State. A resume of the activities in each State is given below.

MAINE

W.O. Frost, State Leader

The State cooperates with towns and individuals in Ribes eradication, by furnishing scouts to systematically examine town control areas in order to determine the Ribes concentrations, which are to be eradicated by individual owners working under the supervision of town foremen paid from town funds. The Ribes concentrations occupy about 15 percent of the control areas; consequently, the Ribes on 85 percent of the total acreage are eradicated by the scouts. However, the bushes pulled by these men represent less than one percent of the total number destroyed.

The amount of cooperation in control work during the period 1922 - 1929 is evidenced by 346 town appropriations totaling \$59,773.52 and by the assistance of over ten thousand pine owners who furnished labor, valued at \$71,054.75, in eradicating Ribes. During this period, a total of 2,205,094 acres were cleared of 14,609,891 wild Ribes and 97,232 cultivated bushes at a per acre cost of 7.2 cents. Ribes nigrum were destroyed in connection with the regular town control projects. No compensation has ever been paid for any of the cultivated bushes eradicated.

During 1929, control measures were applied on 233,543 acres; 2,090,340 wild Ribes being destroyed at a cost of 9 cents per acre. This area is over 30,000 acres larger than that worked in 1928, in spite of moderate decreases in town and individual expenditures. The total area cleared of Ribes in 1929 is composed of 203,320 acres worked by the state scouts, 25,363 acres (Ribes concentrations) worked by the pine owners with the assistance of town foremen, and 4,790 acres covered by town crews irrespective of property lines. In addition, it was necessary to enforce the state law to eradicate the Ribes on 70 acres belonging to three owners. In such instances, the State did the work, charged the cost to the town, which reimbursed the State. The town in turn collected from the individuals by means of taxes. Compared with the three persons who refused to cooperate, there were 1,146 willing cooperators who expended \$8,261.32 for control work. A total of \$9,429.83 was also expended by 55 towns in the eleven southern counties of the State. In addition, the Federal Government expended \$1,235.40 in eradicating 74,373 Ribes from 1,148 acres in the Acadia National Park.

NEW HAMPSHIRE

L. E. Newman, State Leader

The State cooperates primarily with towns, paying 20 percent of the total cost of the town projects. The control work is performed by state crews (paid from state and town funds) working systematically definite town blocks irrespective of property lines. Some cooperation is also obtained from individual owners, who desire to pay for the work on their lands. The State assists such persons by paying 20 percent of the costs of the control work.

During the period 1918 to 1929 inclusive, 800 town appropriations made available \$263,300 for control work. Also, during this period, 638 individual cooperators expended \$44,456.91 in the application of protective measures. This cooperative work resulted in 2,525,509 acres being cleared of 29,104,786 wild Ribes and 135,411 cultivated bushes at a per acre cost of 18.3 cents. In addition, 6,384 acres of White Mt. National Forest land was cleared of 142,556 Ribes. The total acreage listed above includes 334,738 acres reworked since 1922. This acreage represents 69.5 percent of all re-eradication work that has been performed in New England and New York. In New Hampshire, Ribes nigrum have been eradicated in conjunction with the regular town control projects. Since 1922, only 22 persons have claimed compensation for cultivated bushes destroyed. Control has also been established and is being maintained in the state nursery and in the two commercial pine growing nurseries.

In 1929, 252,144 acres were cleared of 2,102,999 wild Ribes and 6,644 cultivated bushes at a per acre cost of 16.1 cents. A total of \$29,757.90 was made available by 97 towns for the application of control measures. This is an increase of \$1,057.90 over 1928. Because some of the backward towns had not cooperated, the state legislature passed a law in 1929 requiring towns to appropriate for blister-rust control work, amounts not to exceed \$400. in any one year, provided the state forester and the governor and his council demanded such action. No compulsory measures, however, were applied during 1929.

VERMONT

P. H. Merrill, State Leader

The white pine in Vermont is confined chiefly to small woodlots along a strip, a few miles wide, adjacent to Connecticut River and to a comparatively narrow belt about 100 miles in length in the Champlain Valley. Control work is conducted in cooperation with pine owners who pay all Ribes eradication costs, except an amount representing the difference between the wages of foremen and laborers. This excess cost is usually paid by the State; but in a few instances, town money (totaling \$705.90) has been received for this purpose.

During the period 1922 to 1929 inclusive, individual cooperation by 1,617 pine owners amounted to \$54,931.70 for eradicating 1,789,002^{wild} Ribes and 5,645 cultivated bushes from 163,134 acres of land. A systematic black-currant survey was begun in the agents' districts during the fall of 1928 and continued during 1929. Such work has been completed in 20 towns and partially finished in 3 additional towns. Exclusive of the state nursery, which has been effectively protected from blister rust, there are no nurseries growing white pine in the state. In 1929, 13,300 acres were cleared of 110,671 wild Ribes at a per acre cost of 48.8 cents. This acreage is 20 percent less than that worked in 1928; the reduction being caused mainly by decreasing the number of permanent agents from three to two.

MASSACHUSETTS

C. C. Perry, State Leader

In Massachusetts, about twenty state scouts are used each year to systematically examine block units in designated groups of towns to determine sections requiring intensive control measures. Later, the control work in such areas is conducted by pine owners under the direction of the scouts and the five permanent agents. From 1922 to 1929 inclusive, individual cooperation by 13,297 owners amounted to \$63,588.28. The state scouting and the cooperative work resulted in 1,602,116 acres being cleared of 9,485,293 wild Ribes and 210,452 cultivated bushes at a cost of 13 cents per acre. This acreage includes 75,808 acres reworked since 1922.

Through the continued use of window and roadside displays, the publication of news items in the local press, and the distribution of printed circulars, the subject of blister rust and its control was kept before the general public during 1929. Intensive interview work, the use of demonstration infection plots, reminder cards, and letters, resulted in gratifying cooperation from 1,756 property owners and four state departments. During the field season, 242,079 acres of land were examined for Ribes, and from this area 824,866 wild Ribes and 31,639 cultivated Ribes were uprooted at an average cost of 11¢ per acre. In addition to this initial eradication of Ribes, a limited amount of re-eradication work was performed. This involved the examination of 16,336 acres of land by 53 cooperators, and the eradication of 16,173 wild and 7 cultivated Ribes. In the combined work of the season, local cooperating agencies expended the equivalent of \$12,131.16 in time or for the hire of labor.

The policy of the Division of Plant Pest Control to establish Ribes-free conditions in the environs of only the more important white-pine producing nurseries was continued during 1929. Sanitation measures were applied to four commercial nurseries owning areas in eight towns. Three of the state nurseries were also examined, but no Ribes were located. Future sanitation work will be limited to reinspection of the environs of those nurseries which have already been initially protected. In 1929, black-currant eradication work was continued as a special project in three towns. In addition, such bushes were destroyed in all other towns where eradication of wild Ribes was performed during the season. A total of 3,541 Ribes nigrum were uprooted and the project completed in 27 towns.

RHODE ISLAND

A. W. Hurford, State Leader

All control work in Rhode Island is performed by state scouts. It can be done more cheaply and effectively by these men, since wild Ribes average less than one per acre and are restricted to a few types. No cooperation in wild Ribes eradication has been solicited, except during three years when 8 individuals gave \$581.36 for applying control measures. Initial control, through eradication of wild Ribes, has been established in all the white-pine areas except about 250 acres. During the period from 1918 to 1928 inclusive, 283,592 acres were cleared of 206,744 Ribes at a cost of 10.8 cents per acre.

This acreage includes 10,910 acres reworked since 1922. In 1929, all control work was limited to systematic eradication of Ribes nigrum. A total of 5,703 Ribes nigrum and 906 other cultivated bushes were destroyed in 22 towns.

CONNECTICUT

J. E. Riley, State Leader

The native white pine in Connecticut is confined chiefly to the northern half of the State, being most abundant in the northwestern and northeastern portions. In Litchfield County, where pine and Ribes are more or less generally distributed, the State cooperates with individuals and towns in applying control measures; the State furnishing foremen and scouts and the individuals and towns supplying labor or funds to employ crew men. Outside Litchfield County, the Ribes are so few and localized that control work is limited chiefly to systematic scouting by state men. During the period 1922 to 1929 inclusive, town funds for control work totaled \$7,701.38. This amount includes \$1,924.83 subscribed by individuals for town projects. In addition, 424 individuals expended \$8,000.83 for eradicating Ribes on their own lands. The state scouting and the cooperative work with towns and pine owners during this period resulted in 206,421 acres being eradicated of 1,581,108 wild Ribes and 17,203 cultivated bushes at a cost of 25.5 cents per acre. This acreage includes 19,103 acres reworked since 1924.

Nursery sanitation work was continued during 1929 in the environs of eleven nurseries, 5,960 acres being cleared of Ribes at a cost of \$832.12. All this work, except that on 380 acres, was re-eradication. Only five nurseries intend to qualify under the provisions of Quarantine 63. Nine nurseries will continue to maintain the sanitation zones. In connection with the regular control program during 1929, 34,597 acres were cleared of 134,407 wild Ribes and 10,922 cultivated bushes at a per acre cost of 23.2 cents. This acreage is a decrease of 53.9 percent over 1928, caused chiefly by less men being employed on scout work. A systematic survey to exterminate Ribes nigrum will be started during 1930.

NEW JERSEY

P. B. Mott - State Leader

From a forestry viewpoint, there is very little white pine in the State; however, it has been planted extensively as an ornamental, especially in the Red Bank and Morristown sections. Scattered native white pine occurs in the northwestern part of the State in the counties of Sussex, Passaic and Warren. Prior to 1929, all blister-rust control activities in New Jersey were conducted by a few temporary men, employed during the summer months on scout work to determine pine, Ribes and infection conditions. Since August 1929, a permanent agent has been employed on a part time basis. Due to the

limited amount of native white pine, his activities are confined to nursery sanitation, inspection and protection of plantations, black currant eradication, scouting, and direction of control work where needed.

Many owners have destroyed their Ribes nigrum. There is also an unwritten agreement between the New Jersey nurseries not to sell these bushes. Wild Ribes are known to exist in the northern part of the state, Ribes rotundifolium and americanum having been reported. The location of these wild bushes in relation to pine is such that their destruction does not appear urgent. During 1929, an inspection was made of the sites and environs of the white pine plantings made from stock distributed that year by the Department of Conservation and Development. These locations were examined for Ribes, and when such bushes and older pines were found nearby, they were inspected for infection. Owners, in each case, were advised regarding the disease and control measures. The plantations varied from 500 to 10,000 seedlings; and on the 30 sites examined, 323 cultivated Ribes were located. None of these bushes were infected. Card and map records of this work were kept for future reference.

NEW YORK

H. L. McIntyre, State Leader

Most of the white pine in New York is located in the eastern part of the State, north of the Mohawk River. However, scattered areas of native pine can be found throughout the remainder of the state. Up to and including 1929 56,458,488 white pines had been planted in New York, most of these trees being set out in sections outside the white-pine belt. The state owns considerable white pine. In the future, control work on the state forest preserve will be restricted chiefly to pine areas of scenic importance; isolated pine areas of medium or old growth will not be protected. The State is cooperating with pine owners by furnishing foremen to supervise control work on private lands. During the experimental control work from 1918 to 1921, 68,062 acres were cleared of 4,511,845 wild Ribes at a cost of \$2.50 per acre; forty-one individuals expended \$18,658.34 assisting in this work. In the application of protective measures from 1922 to 1929 inclusive, 3,791 individuals spent \$119,350.56 on Ribes eradication. The control work during this period resulted in 411,257 acres being cleared of 10,045,507 wild Ribes and 25,295 cultivated bushes at a cost of 86 cents per acre. The decrease in cost during the latter period was caused chiefly by working in new sections where the Ribes were less abundant and the topography less rugged. Since the inauguration of the present program, re-eradication work has been performed only during 1928 and 1929, when 19,686 acres were reexamined.

During the past several years, nursery sanitation measures have been applied to protect the pine areas in the state nurseries. The protection zones were for some time maintained at 900 feet. During 1928, this distance was increased to 1500 for all Ribes, except nigrum, which were eradicated within one mile of the pine areas. Up to 1929 inclusive, Ribes nigrum had been eradicated from within one mile of each of the five state nurseries.

The 900 foot Ribes-free zones have been completely extended to 1500 feet around three of these nurseries and partially finished around the other two. All of the sanitation work in 1929 was confined to the state nurseries. In 1928, the first attempt was made to establish protection zones surrounding some of the commercial nurseries, particularly in Wayne and Westchester Counties. It soon became apparent that cultivated Ribes were extremely abundant in the vicinity of these nurseries. As compensation had to be paid for such bushes destroyed, it was evident the work had to be limited. Therefore, it was restricted to a general survey to determine and record Ribes conditions in the environs of these nurseries and to eradicate Ribes nigrum in such situations. According to the revised state blister-rust law, effective February 17, 1930, no compensation shall be paid by the State for any species of Ribes destroyed in connection with the establishment of Ribes-free zones around commercial nurseries, but fair compensation for such bushes must be paid by the person owning or operating the protected nursery.

The New York state law prohibits the possession of Ribes nigrum. A systematic survey to eradicate these bushes was begun in 1928. This work was confined chiefly to control areas and to environs of nurseries. It resulted in 8,825 black currants and 439 flowering currants being destroyed, not including bushes eradicated in connection with the regular control work. During 1929, black-currant work was conducted as a special project in 47 towns in eleven counties. A total of 4,048 Ribes nigrum were destroyed, exclusive of the black currants eradicated in conjunction with the regular work, which cleared 127,756 acres of 1,982,671 wild Ribes and 6,745 cultivated bushes at a per acre cost of 51.2 cents. This acreage is an increase of 33.3 percent over that worked during 1928.

PENNSYLVANIA

H. E. Clepper - State Leader

According to a preliminary survey, there are about 375,000 acres of white pine growth in Pennsylvania, exclusive of a vast unestimated acreage containing less than 20 percent pine stocking in mixture with other species. In addition, over 41 million white pines have been distributed from the state nurseries since 1903. Up to 1929, inclusive, blister rust had been located on pines in 27 of the 67 counties in the State. The disease is known to be present in the State from the New York border on the north to the Maryland border on the south. It exists in the counties along the Delaware River on the east, and extends across the State westward nearly to the Ohio line.

Prior to 1929, the blister-rust control activities were limited chiefly to scouting for pine, Ribes and infection during the summer months by one or two temporary men employed cooperatively by the state and federal Departments of Agriculture. The first demonstrations of control methods were held during 1928 by the Department of Forests and Waters in cooperation with the Office of Blister Rust Control. In 1929, the work was definitely organized on the following basis. The state Department of Agriculture agreed to assume administrative direction of cooperative employees, conduct such control activities as agreed upon each year by the cooperating parties, and to enforce state

laws under which blister rust control is conducted. The Department of Forests and Waters agreed to undertake the application of local control measures on state-owned forests; cooperate with counties, towns, associations, and individuals in the application of local control measures; provide supervision and checking of work. Control activities were restricted almost entirely to state-owned lands during 1929. It is expected the Department of Forests and Waters will assume the responsibility of directing all control work in the state during 1930.

The control work in Pennsylvania prior to 1929 was restricted to eradication of Ribes in the environs of the Clearfield state nursery and to three small demonstration control projects conducted in 1928. During 1929, Ribes eradication work was performed in 23 units in 8 state forest districts. A total of 4,877 acres were cleared of 305,585 Ribes at a cost of \$3,348.96. In addition, cooperative work with individuals resulted in 1,100 wild Ribes and 520 cultivated bushes being eradicated at a cost of \$170.00 to the owners and \$39.00 to the State. This work on state and private lands was supervised by the district foresters who were assisted by L. W. Hodgkins of the Federal office in organizing and training the field personnel. The white pines at "Hearts Content" on the Allegheny National Forest were also protected by the U. S. Forest Service in cooperation with the Bureau of Plant Industry. A total of 461 acres were cleared of 23,028 Ribes at a cost of \$198.30

MICHIGAN

D. J. Stouffer - State Leader

Most of the white pine in Michigan is located in the upper half of the lower peninsula. A preliminary survey shows over 800,000 acres of white pine growth occurring chiefly in mixture with other tree species (20-79% pine). In addition, there is a considerable acreage of mixed forest containing less than 20 percent pine stocking. Up to 1929, blister rust had been reported on Ribes in 32 counties and on native pine in three counties. Prior to 1927, blister-rust control work was restricted to a limited amount of scouting for infection by temporary employees. In 1927, a permanent agent was assigned to take charge of all blister-rust control activities in the State. However, no control work was conducted until 1928, when Ribes eradication was begun in one town by means of a town appropriation and some individual cooperation. The state legislature passed a definite blister-rust control law in 1929 and made an initial appropriation of \$20,000 for control work. As a result, the 1929 activities included all the various phases of control. An additional permanent agent was appointed during the latter part of the year.

In 1929, cooperative control work in two towns resulted in 400 acres being cleared of 51,089 wild Ribes at a cost of \$365.69 to the State and \$199.50 to the towns. In addition, the State cleared 119,893 wild Ribes from 2,170 acres of public lands (including three public nurseries) at a total cost of \$3,042.26. Systematic eradication of Ribes nigrum was also begun on a county basis during 1929. Such work was completed in five counties on the lower peninsula and partly finished in two other counties. As a result, 5,194 cultivated black currants were located and destroyed at a total cost of \$6,452.64.

WISCONSIN

H. J. Minnman - State Leader

Native white pine (pure and mixed) is found in scattered woodlots in 33 Wisconsin counties, pure stands being present in only nine. Nineteen additional counties have only pine plantations. According to a preliminary survey, there are a total of 120,883 acres of pure pine (80-100%) and mixed white pine (20-79%) in the State. In addition, there is a large acreage of mixed growth containing pine stocking of less than 20 percent. State appropriations, totaling \$34,500 were made available for blister-rust control work during the period 1918 to June, 1923. Since that time, no state appropriations have been made for this project. However, a very limited amount of such work has been performed through funds derived from other state sources and from assistance given by a few individual cooperators. The control work prior to 1924 consisted of the local eradication of Ribes to protect pine areas and the destruction of infected pines to prevent the spread of the rust. These activities resulted in 2,048,424 Ribes being eradicated on 29,596 acres, and in the destruction of infected pines on 17 areas comprising about 1,000 acres. Except for a small amount of individual assistance, all this work was performed by state men supervised by a permanent agent. However, during the past few years, this agent has been used chiefly on special assignments; such as, transit inspection, experimental work at Eau Galle demonstration control area, scouting, etc. It is expected that a definite control program will soon be adopted, supported by adequate appropriations and carried out under the direction of a permanent state leader.

MINNESOTA

L. B. Ritter, State Leader

The natural white pine range in Minnesota is north of a line drawn from southern Washington County to the southwestern corner of Kittson County in the extreme northwestern part of the State. According to a preliminary survey, there are 610,428 acres of pine growth in the State, excluding a large acreage of mixed stands containing pine stocking of less than twenty percent. In 1929, blister rust was known to be present in 18 counties. Pine infection in natural pine stands had been found in 12 counties as far north as Two Harbors in Lake County, west to Crow Wing County and south to Washington County. The amount of disease has increased at a more rapid rate during the past few years.

An effort was made during 1917 to 1919 to eradicate blister rust from the State by the destruction of Ribes and diseased pine in the known infection areas. Late in 1919, the futility of entirely eradicating the disease was realized and all future work was placed on the basis of local control. During the period 1918 to 1922 inclusive, a total of 4,981 acres were cleared of 407,278 Ribes. All of this work was performed by the state, except for the assistance of 11 pine owners who expended \$154.30 on control projects during 1921 and 1922. Since 1923, the control project has been restricted to the work of one or two temporary men cooperatively employed during the summer months on scouting for infection and on studies of blister rust damage and Ribes regrowth. In 1929, a permanent state leader was appointed to take charge

of all blister-rust control activities in the State, and a blister-rust control law was enacted by the state legislature. A definite program and plan of work has been cooperatively developed and approved by the various agencies. Under this general plan, the State will aid pine owners by providing trained men to supervise the eradication of Ribes, but the cost of the actual control work will be paid by the owners.

WESTERN STATES

G. B. Posey, Sr. Pathologist, in Charge.

The aim of the blister-rust control program for the Western States is full kin to the program for the Eastern States in that both programs are predicated upon wisdom of retaining for our users of high class lumber that excellent lumber produced from our white pines. The problem in the West has numerous points of general dissimilarity to the East:

(1) While white pines are present in the following States: Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, South Dakota, Texas, Utah, Washington and Wyoming, they are at present regarded as of large commercial importance in only 5 states, namely, Montana, Idaho, Washington, Oregon, and California. Due to the comparatively small acreage of dense growth of white pines in Washington, Oregon and Montana the big white pine problem lies in Idaho and California. Idaho's lumbering and forestry is conspicuously dependent upon the western white pine (P. monticola). Sugar pine (P. lambertiana) contributes in an important way to the forest production in California.

(2) In the West there are a total of seven white pines, two of which (P. monticola and P. lambertiana) are of great economic importance, while in the East P. strobus is the only white pine. In the West also there are more than 57 varieties (species) of Ribes. However, in the chief belt of western white pine (Inland Empire comprising western Montana, northern Idaho and northeastern Washington) only 4 species are so generally present as to constitute dreaded host plants. These are in order of susceptibility as follows: R. petiolare, R. inerme, R. viscosissimum and R. lacustre. R. petiolare and R. inerme are essentially stream-type species while R. viscosissimum is essentially an upland species. R. lacustre is ubiquitous over the Idaho white pine range. For practical purposes we classify the Ribes of this region as follows: stream type - R. petiolare, R. inerme, and R. lacustre; upland type - R. viscosissimum and R. lacustre.

In the sugar pine region of southern Oregon and California (principally California) many Ribes species are present. Insofar as our studies have progressed in California only two species have had to be seriously considered. These are R. roezli and R. nevadense. R. nevadense is limited chiefly to the moist situation whereas R. roezli is abundant over much of the best sugar pine type.

(3) In the East hand pulling is satisfactory over a wide range of conditions. In the Inland Empire hand pulling is too expensive and not very effective in the stream type because of the profuse growth and complicated root butts of the Ribes. In many cases the Ribes are so thickly matted and layered and so intermingled with roots of other species that effective hand pulling would mean complete cleaning of the ground at tremendous costs (all of it isn't like that but too much of it is and this makes the eradication of your skunk currant patches look like child's play). We are using chemical methods with considerable success in the stream type of the Inland Empire. In California R. roezli, the chief species so far encountered, has a very deep (not measured in inches but in feet and perhaps yards) tap root. The union between top and root isn't strong enough to draw the roots even assuming that we could pull hard enough. The practical method of killing these bushes is by cutting them off 8 to 12 inches below the ground with what they call a "hoc-dag", a heavy, deep bladed grub hoe. Strange to say the eradication boys in California don't grumble about packing this tool along though it is quite heavy. We hope to use chemicals successfully in California.

(4) In the East most of the work is near good sources of labor and home cooking. In the West we must import the labor and there are no home cooks at all in most of our eradication tracts. The work out there is uniformly a camp unit proposition. The transportation is by truck when trails permit. The rest of it is via mules and shanks' mares.

(5) Those of you who have conducted pine infection studies and blister-rust damage studies in general in the P. strobus region, have doubtless been amazed at the large amount of infection that sometimes results from only a small amount of Ribes leafage. This situation is much worse in case of western white pine. Mr. Lachmund of the Portland, Oregon, branch office of Forest Pathology, Mr. Putnam of our Spokane Office, Professor Spaeth of Cornell, Mr. Detwiler, and perhaps others who have studied this matter, will have something definite to say on this matter later on. However, it is unanimously held by these men that monticola is several times more susceptible than strobus, all other factors being equal. I believe that Mr. Lachmund rates the susceptibility of lambertiana about on a par with monticola. At least we have this to be thankful for that P. albicaulis isn't a very important timber tree, for Lachmund tells us that it is some 20 times as susceptible as monticola.

Those aren't all the differences between East and West but they will do for the present. The East should be thankful that they have P. strobus, a comparatively resistant species and that they have relatively easy working conditions. The boys in the West don't claim that they will come through the fight in such excellent plight as have the Easterners, but they do claim that they are going to save the western white pine and sugar pine if clearing out Ribes at low costs will turn the trick. If you have a spare moment to give us a thought, a prayer, or a suggestion, don't be stingy.

Discussion:

The reports from the various cooperating States stimulated more or less discussion relative to cooperation by municipal units, and whether or not in States like New York for example, that do not have the pioneer type of town-meeting government, any other unit such as a county could function in the same way in making available public funds for blister-rust control work. The gist of this discussion was to the effect that in New York State it has not been the practice for counties to appropriate funds for work of this nature in a town. In Michigan such appropriations would be unlawful, because of the fact that the county cannot appropriate for anything that would be essentially an aid to property owners. The point was made by Mr. Riley of Connecticut, that as a rule the county unit is too large to serve the same purpose as that of the New England town. Local sentiment is what is needed.

Topic: EFFECTIVENESS OF CONTROL

Under this heading, Mr. Posey presented a summary of 58 twin-plots reported by the blister-rust control agents, and representing studies in comparable plots in areas where Ribes had been eradicated, and in areas where no Ribes eradication has been undertaken. It was pointed out (Newman and King) that it was difficult to find exactly comparable plots due to the diversified conditions, even in small sections throughout New England.

Mr. Filler explained that the results of these studies indicated that about 95% of the pine infection originating since Ribes eradication, occurred in the unprotected plots. Mr. King cited one plot in pine reproduction (over 900 trees to the acre), where Ribes were eradicated in 1924, where over 55% of the trees were infected, but only six of these infections had occurred after eradication. These latter infections, moreover, had been caused by two sprouts arising from improperly uprooted Ribes bushes. The data secured have been of appreciable help (King) in securing cooperation, the data having been quoted quite generally in connection with other infection and damage figures. The information has resulted in changing sentiment of groups in a town where an appropriation was desired. The studies have paid for themselves one hundred times over as a practical proposition. Mr. Mandenberg reported that he had used similar data ("pie"-charts, etc.) furnished to him through the courtesy of Mr. Newman, and he mentioned one instance in particular, where charts showing blister-rust damage had helped in securing a \$20,000 appropriation for blister-rust control work in that State. Mr. McIntyre who made the original suggestion which resulted in the securing of the twin-plot data, felt that the studies were a step in the right direction, and that it would be desirable to extend them to include the determination of the effect of the rust upon pine reproduction.

Effectiveness of Blister Rust Control As Determined by Studies Conducted in New Hampshire, Vermont and New York During 1928 and 1929.

To determine the effectiveness of the initial eradication of currant and gooseberry bushes (Ribes) in controlling blister rust, pine infection

studies were made in 68 towns in New Hampshire, Vermont and New York during 1928 and 1929. When possible, two one-acre plots were laid out in each town; one being in a pine area cleared of Ribes some time during the period 1918-1925; and the other in a similar but unprotected pine tract. Due to the fact that the initial control work had been completed in several of the towns, it was necessary to locate comparative unprotected plots in nearby or adjoining towns. All pines in the plots were carefully examined for infection, and the ages of the cankers recorded. In each case, the age of the canker was determined by ascertaining the age of the wood at the point of entry of the fungus. Usually this method gives the age of the canker within one or two years, and while not scientifically exact, it is sufficiently accurate for practical purposes.

The following table summarizes blister rust infection conditions in the two classes of plots.

Comparison of Blister Rust Infection on Pines in Protected and Non-protected Plots

<u>Conditions</u>	<u>Plots in areas cleared of Ribes</u>	<u>Plots in areas not cleared of Ribes</u>	<u>Number of times the amount of pine infection in non-protected plots exceeds that in protected plots</u>
Total number of white pines ...	24,608	23,466	-
Number of infected pines	3,511	7,604	2.17
Percentage of pines infected ..	14.3	32.4	2.27
Number of pines killed by blister rust	810	1,710	2.11
Percentage of pines killed by blister rust	3.29	7.29	2.22
Number of cankers before eradication	5,206	8,890	-
Cankers per tree before eradication	0.212	0.379	-
Number of cankers originating during period 1909-1927 ..	5,710	16,917	2.96
Do per tree	0.232	0.721	3.11
Number of cankers originating since dates protected plots were cleared of Ribes	504	8,027	15.93
Do per tree	0.020	0.342	17.10
Percentage of cankers originating since dates protected plots were cleared of Ribes	5.91	94.09	15.92

Topic: NURSERY SANITATION

The subject of nursery sanitation work was brought up in connection with the consideration of a proposed change in the responsibility for the effectiveness of control work performed in the environs of white-pine growing nurseries. This matter was covered by a letter from Dr. Marlatt, Chief of the Office of Plant Quarantine and Control Administration, to Dr. Taylor, Chief of the Bureau of Plant Industry. This letter read to the conference by Chairman King suggested in substance, a change in procedure in the handling of requests for pine shipping permits under the present plant quarantine (No. 63). This suggestion in effect, pointed out that Ribes eradication work around the nurseries should be performed by the men engaged in regular control work, in order to insure more effective work. The recommended change provided that it would be the function of the State Blister-Rust Leader to assume the responsibility for the work.

The reading of the letter provoked considerable discussion as to the possibility or practicability of obtaining 100% Ribes-free conditions; regarding compensation for cultivated Ribes; and as to the susceptibility of the different varieties or species of black currants.

The difficulty in obtaining 100% Ribes-free conditions was pointed out (Perry of Massachusetts) particularly as to the difficulties involved in preventing the replanting of Ribes in thickly settled communities where it is practically impossible to prevent the occasional planting of cultivated Ribes between inspections. Mr. Sheals, representing the Plant Quarantine office, although declining personally to accept responsibility for any rulings, maintained that the finding of Ribes would warrant the suspension of a shipping permit.

With regard to the matter of compensation for cultivated Ribes destroyed in connection with nursery sanitation work, it was reported (Riley) that in some cases it had been necessary to pay compensation, but that in others the nurserymen had replaced the Ribes with other stock. Mr. Clark of Connecticut pointed out, and Mr. Mandenberg concurred in the opinion, that stock grown for local distribution within any State, should receive the same protection from blister rust as stock to be shipped interstate.

The discussion regarding the susceptibility of the different varieties of cultivated black currants resulted from the inquiry of Mr. McIntyre who was concerned about the apparent lack of uniformity in the laws and regulations in different States relating to the shipment or planting of different species of black currants. Mr. Detwiler explained that the confusion is apparently attributable to the fact that in the early stages of the control program, it was felt that the varieties of the black currant group as a whole, were equal in susceptibility to that of R. nigrum. For that reason, R. odoratum was classed with R. nigrum in the first quarantine, established in 1917. The consensus of opinion as expressed by Mr. Detwiler and by Mr. Riley, was to the effect that R. odoratum varies considerably in susceptibility, and that there may be two different strains. In general, it is felt that they are about equal in susceptibility to red currants.

Mr. Detwiler concluded the discussion on the subject of nursery sanitation by saying that the nurserymen are entitled to the same protection for their white pine stock, as any other pine owner. He emphasized the importance of doing effective work, and felt that by making early spring reinspections of the environs, the danger from the replanting of cultivated Ribes would be kept at a minimum.

Topic: RE-ERADICATION

The discussion on the subject of the re-eradication of Ribes involved more or less difference of opinion as to whether the initial eradication program should be completed before attempting to do any re-eradication work whatsoever. Mr. Foster, State Forester of New Hampshire, felt that there has been more or less of a pledge to cover the towns initially before any re-eradication work is done. In this connection he called attention to the fact that in New Hampshire, a new State statute has been enacted, by which under certain conditions, the State Forester can compel towns to appropriate funds for blister-rust control work. It is the desire to carry the provisions of this law into effect, and, thereby carry on and complete initial work in the so-called "backward towns". In other words, all funds are really needed for initial work. Mr. Newman felt that it was not good policy to turn down requests for re-eradication work, and reported that most of such work to date has been in towns which were the first to appropriate for initial control work. In this connection it is interesting to note, that five towns in New Hampshire have completed re-eradication work, and over 20 towns are carrying on the project in various stages. Agent Cullen of New Hampshire believed that it is more important to carry on re-eradication work in areas where Ribes were numerous in the initial control work, rather than to do initial work in the towns where no interest has been shown, and where as yet, nothing has been done. Agent Richardson of New Hampshire felt that it would be unfair to those towns that have completed control work, if re-eradication work is refused when it is requested.

Mr. Detwiler's opinion on the subject having been requested, stated that it is a duty to perform re-eradication work, and that it may be possible to do some such work without impairing the progress of the initial work which remains to be handled. If, as a result of the delay caused by doing initial control work in the backward communities, there is a regrowth of Ribes in the other towns, it will be claimed that the original work was not effective in checking the disease.

All were in agreement that the entire problem comes down to a question of determining where re-eradication work is necessary, and it was the opinion that this fact can be determined by a study of the rate of new infection as well as by the rate of Ribes regrowth. Mr. Newman pointed out that in the re-eradication work that has already been performed in New Hampshire, it appears that the initial work as a whole was well done. Agent Endersbee of Massachusetts and King also stated that their observations showed that initial work was generally effective. This is particularly true when records are considered from the point of view of L.S. (live stem) rather than number of bushes. Mr. Littlefield of New York, in agreement with Mr. Newman, stated that experimental plots laid out in 1924 and 1925 before eradication, when checked in 1929, showed that there is little to worry about regarding Ribes regrowth. There was less live stem than in 1924 and 1925. The real danger, in Mr. Little-

field's opinion, is where field conditions are upset by logging, burning, or other mechanical agencies.

A survey of the towns, where initial work was completed more than five years ago, was suggested by Mr. Filler, for the purpose of determining present Ribes conditions. Mr. Mandenberg agreed with the necessity for such a survey, but while Mr. Newman also appreciated the need, he did not feel that funds could be diverted for such work at the present time. It was suggested by Dr. Martin, of the Washington Office, that the agents might do the work. In this connection, Mr. Detwiler pointed out that it is not essential to determine Ribes conditions, but rather to find the areas where infection is on the increase. This can be done after the Ribes eradication season, when it will not disturb the supervision of the field work or interfere with other pressing duties.

Recess for dinner

Friday, November 1

Evening session: Administration Building Pack Forest

Chairman: H. E. Clepper, State Blister-Rust Leader of Pennsylvania

The scheduled program for this session of the conference was designated "Smoker - Bring your pipe and pet topics". Such an invitation in the older days, would have resulted in a free-for-all combat of opinions regarding local problems concerning which even the best of friends would have been obliged to finally "agree to disagree". Although the plan was to have this session very informal, it was necessary to guide the discussions by the use of suggested topics.

Topic: EXHIBIT MATERIAL

Agents Doore and Endersbee of Massachusetts, and Swain of New Hampshire, demonstrated a number of exhibits which they have found useful in connection with general educational work. Interest in this subject was expressed in the general discussion of the subject, during which Mr. Pierce of the Washington office offered the facilities of his office, for the preparation of any material needed along this line. He pointed out, however, the desirability of making such requests very specific in character. In other words, "tell us your needs, and we shall endeavor to comply with them". Mr. Mandenberg and others agreed that there is a vital need for a folding window-exhibit, such as is used for general advertising purposes, and similar to exhibits now in use by the Office of Barberry Eradication. The suggestion was made that something of this type be immediately prepared by the Washington office and furnished to the various states.

Topic: WHITE-PINE WEEVIL CONTROL

With the unusual amount of interest that has been in evidence lately with regard to the white-pine weevil and its effect on white pine, it was quite natural that the discussion of this particular subject, became quite lengthy and that it was of much interest. Dr. H. B. Peirson, Forest Entomologist of Maine, was called upon to give his opinion with regard to the damage caused by the weevil, and stated that he could not help but feel that it is really unsafe to plant white pine in pure stands on open sites, on account of the evidence now available as to the damage caused by the weevil in such locations.

Professor J. N. Spaeth of Cornell took issue with Mr. Peirson on this point, and expressed his regret that anyone should recommend the discontinuance of the planting of white pine. Professor Spaeth cited one instance of the practice of intensive control measures where the cutting off of the infested leaders when they showed the first sign of infestation in the spring, had been most successful. In this instance, all but one of the remaining branches in the whorl were cut off at the same time as the terminal, thus eliminating the possibility of the development of two leaders. By cutting in the spring, the growth of the new leader was thereby stimulated, and straighter growth encouraged.

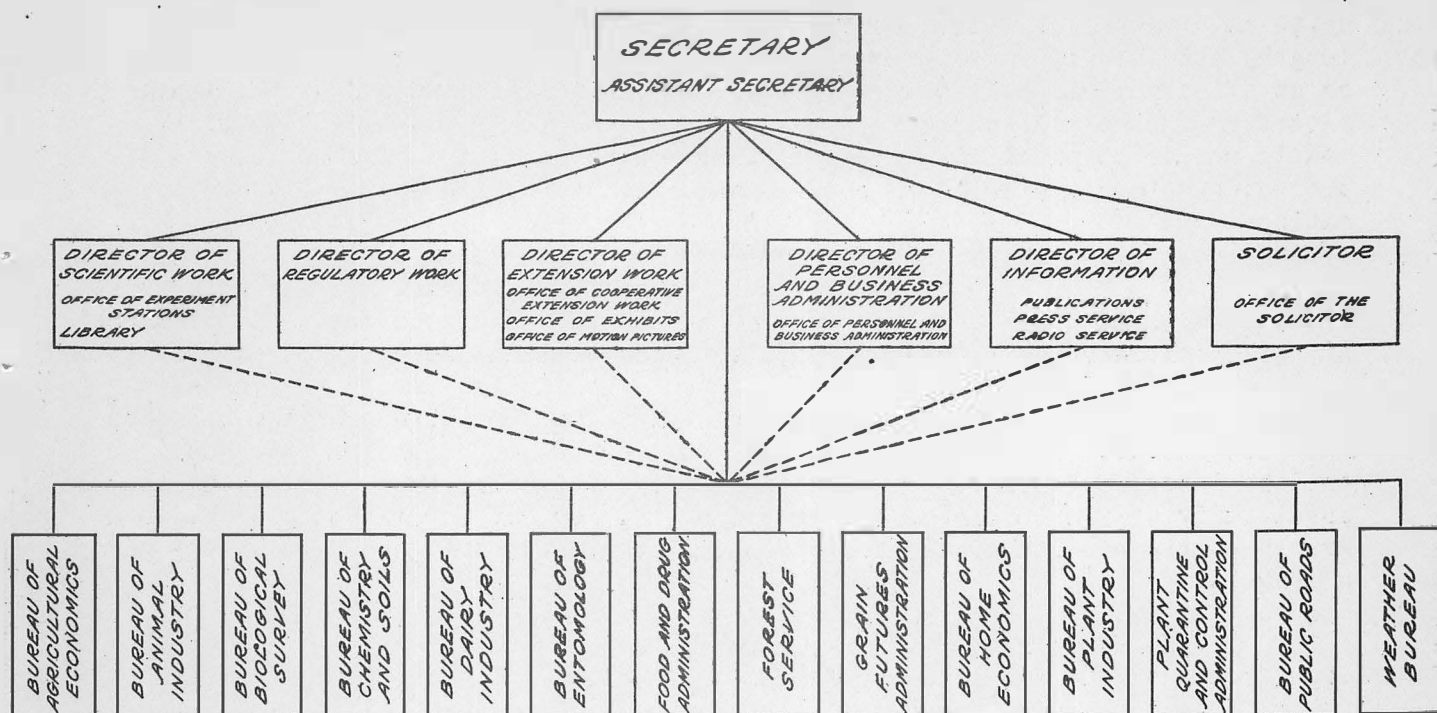
Dr. H. H. York of New York, emphasized the need for data on just such experiments as the one cited by Professor Spaeth.

Mr. Detwiler concluded the discussion on the subject, by urging that the problem of weevil control be attacked anew. He cited the highly valuable work that has been done by the research activities of the officials of the Japanese Beetle Control office, particularly in the line of "trapping", and he felt that in the case of the weevil, we had far from exhausted the effective lines of attack. Mr. Detwiler maintained that if someone could devote his entire thought and energy to the important problem of weevil control, a solution would be found. He felt that it would be little short of suicidal to give up and say that white pine can not be grown on account of the weevil.

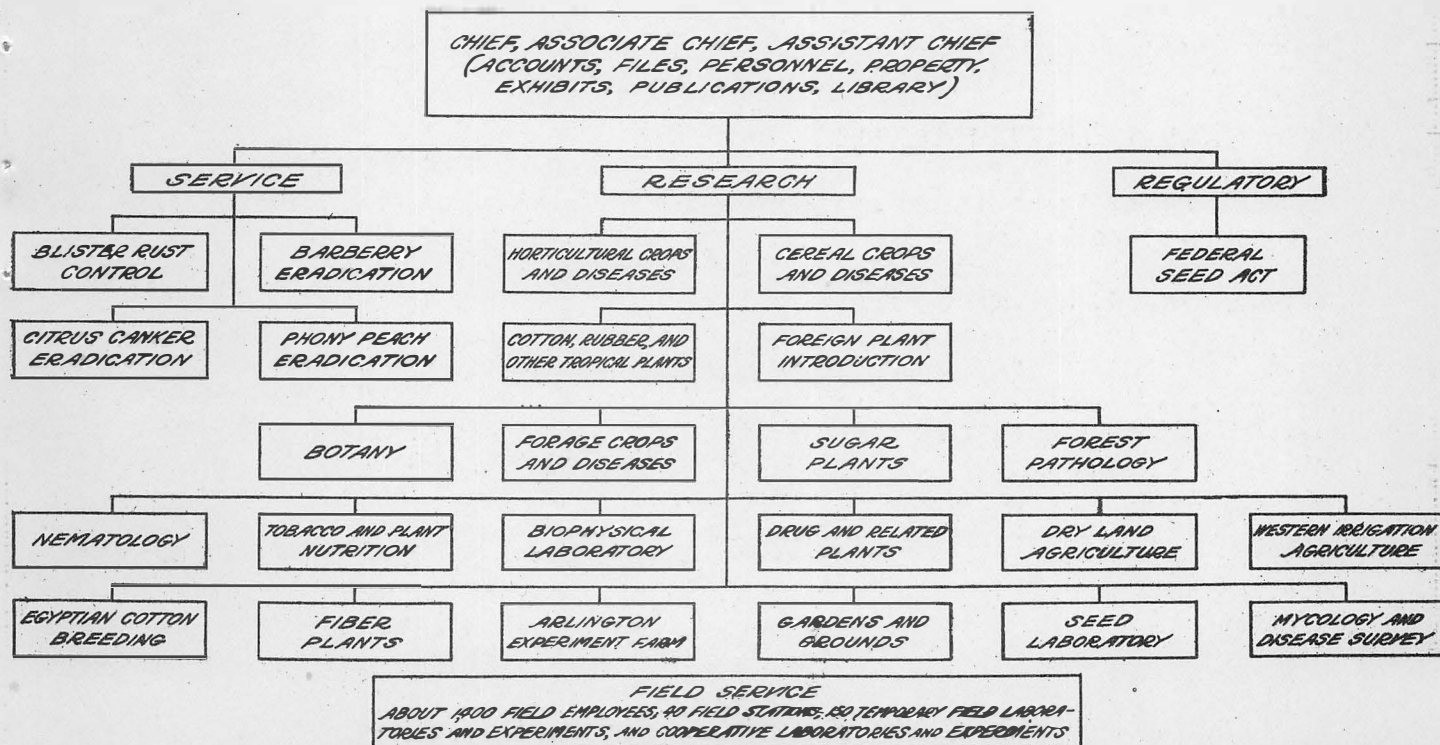
Topic: ADMINISTRATIVE RELATIONS

The real treat of the conference was the opportunity afforded the members to meet and listen to the words of Mr. H. E. Allanson, Asst. Chief of the Bureau of Plant Industry. Attending the conference as the official representative of Dr. W. A. Taylor, Chief of the Bureau of Plant Industry, Mr. Allanson was glad to convey to the members of the conference, the best wishes and kindly interest of Dr. Taylor, and to express the latter's regrets that he was unable to attend the conference personally. In a most friendly sort of way, Mr. Allanson endeavored to explain the necessity for rulings and regulations governing expenditures, and the need for detailed information to accompany expense accounts, for the proper interpretation and audit of all items that are unusual in character. Mr. Allanson was most emphatic in expressing the sincere desire of his office to be helpful, and in return requested the cooperation of all employees in this matter of administrative relations.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE



BUREAU OF PLANT INDUSTRY



Some idea of the magnitude of the work of the United States Department of Agriculture as a whole, and of the Bureau of Plant Industry in particular, was obtained from Mr. Allanson's exposition of the work of the different offices.

Advantage was taken of Mr. Allanson's presence at the conference, to question him on many technical points that have arisen from time to time in the matters of administration. Mr. Allanson also gave an extended description of the recently announced Group Life Insurance Plan in the Department, and explained the benefits of the protection secured at such relatively low rates. Reference to the matter of the contemplated purchase and operation of Government-owned motor vehicles, brought up a number of inquiries relating to the responsibility of the operators of such vehicles in case of accident. It was pointed out by Mr. Allanson, that although the Government does not carry liability insurance of any kind, it is now possible to obtain accident liability insurance policies at low rates. These policies protect the operators of such vehicles, and Mr. Allanson recommended, that when the time comes, employees should purchase such policies for their own protection.

REMARKS BY Mr. Ralph L. Morgan of New Hampshire

The conference was favored by the presence of Mr. Ralph L. Morgan of New Hampshire, an ardent layman from that State, who has recently been appointed chairman of the Forestry Committee of the New England Council. In response to a request for a word of greeting and counsel, Mr. Morgan was pleased to express his friendly interest in the blister-rust control problem, and in forestry in general. He pledged his best effort to aid also in the solution of the situation which is now present in the northeast, where western competition, taxes, unsatisfactory markets, and so on, have temporarily clouded the situation regarding the prospect for the further development of our eastern forests.

CLOSING REMARKS by Mr. Detwiler

In concluding the session of the evening, Mr. Detwiler wished to express his appreciation of the letters and telegrams of regards which he had received from time to time during his absence, and stressed his confidence in the successful continuance of control work to adequately protect our white pines from the blister rust.

Adjournment for the day at 10:00 P.M.

Saturday, November 2

Morning session: In the field

The first item on the program of the morning was a trip through a portion of the Charles Lathrop Pack Demonstration Forest, under the able guidance of the Director of the Forest, Mr. Clifford Foster. One of the prize exhibits on the tract is an old growth coniferous stand (Old Woodward Place) containing a few remnants of apparently virgin forest. A selected sample acre on this lot is estimated to contain 100,000 board feet. A nearby stand of mature pine is growing on an area where the father of Agent (Major) E. G. Woodward of New York dug potatoes nearly 100 years ago.

The effect of blister rust in a stand of pine was demonstrated in a sample plot that had been marked for a thinning by Director Foster. Mr. Foster found that in marking for the thinning, many of the trees that he wished to leave had stem blister-rust cankers. In other words, blister rust had attacked and would cause the death of the trees that would normally be left to make up the future or final stand. This demonstration made it most clear, that blister-rust damage is very much more than a thinning, in that the disease does not take the suppressed and unimportant trees, but does take the pines that are dominant and that normally would remain in the stand. Mr. Foster abandoned his plans for making this particular thinning, but gave Mr. Detwiler permission to cut out all the trees with stem cankers. Following the removal of these trees, data were obtained to show just how much of the stand had been removed. In this instance, it developed that the cutting had not materially harmed the stand, but on the other hand, it had not materially benefited the stand, since the cutting removed considerably fewer trees than would have been marked in a normal thinning and in several cases removed trees that would have been left.

In this instance, the rust spread from a few gooseberries and skunk currants located nearby along and across the road.

During the discussion regarding thinnings, it was pointed out, that in the Warrensburg section, thinnings are more practicable than they are in other localities, due to the fact that there is a local market, a few miles distant, for "plug wood", ^{wooden} plugs for ends of rolls of paper, linoleum, etc. The product from thinnings, after one year's seasoning in the piles, is utilized in this manner.

En route through the forest, many points of interest, such as a beaver dam, coniferous plantations, different types of thinnings, the operation of a tractor in clearing land, etc. were noted.

Darrowsville area:

A comparison of results of Ribes eradication work was provided at this area, where initial control measures were applied in 1918 and 1919, and re-eradication during 1921. The very marked preponderance of infection in the uneradicated portion of the area, was brought out by the use of tags in a half-acre plot. The conditions in this plot were in marked contrast to the conditions in the eradicated section.

A small area that had been cleared of hardwood and brush by the owner in the winter of 1929, served to demonstrate the effect of such disturbances of the forest floor. A plot, 40" x 80" in the disturbed area, supported on August 14, 1929, 802 Ribes seedlings, largely skunk currant, of 1929 germination. Evidently, the seeds responsible for these plants had been lying in the forest floor since the large Ribes were removed in 1918 and 1919. A check plot of similar proportions in a nearby stand, which was not disturbed last winter, had no Ribes seedlings of 1929 germination, and but one seedling of 1928 germination and one skunk currant seedling of 1927 germination.

Remington Lot:

This lot represents another unusual stand of mature white pine, which seeded in naturally on a cultivated field about seventy years ago. Nearly one-half of the biggest timber was upturned by a tornado about five years ago. The remainder of the best portion of the stand is said to contain about 75,000 board feet per acre. The average for the whole lot is estimated to be about 33,000 board feet per acre.

Faxon Plantation:

This plantation, of about two and three-quarters acres in extent, is an excellent example of what can be accomplished in certain instances by transplanting natural pine seedlings to establish a plantation. These pines were dug up from a nearby field and replanted by the original owner (Mr. Faxon). The plantation was made in three sections, the oldest part of which is now about 45 years old.

Starbuck plot:

This lot is a natural even-aged stand of pure pine about 53 years from seed. The stand came in on an old field and has been overstocked from the start. Beginning six years ago, trees dead from suppression have been removed periodically, and the wood used as fire-wood for maple sugar evaporation operations.

A detailed study of the "Growth of White Pine on the Starbuck Lot" by Mr. A. E. Fivaz is found on a later page.

Afternoon session: In the field

The final session of the conference was held near Glens Falls, New York on the estate of Mr. Robert L. James, an enthusiastic layman who has been most active in forest conservation work. Mr. James has demonstrated his interest by establishing on his farm extensive areas of forest tree plantations, principally white pine, red pine, and Scotch pine. In company with Mr. James, and under direction of Dr. York, a tour was made through the plantations during which among other things, many interesting but rather discouraging examples of the damaging effects of plant pests (other than the blister rust) were demonstrated.

PRUNING AND WEEDING:

In a small part of a plantation of red pine, the trees on the outside of the plantation had been pruned as a fire prevention precaution. These trees showed a very marked increase in height growth as compared with the trees not pruned. The trees were pruned in July of 1927; and, therefore, sufficient time has hardly elapsed to permit of too definite conclusions as to the possible stimulating effect of such treatment.

An experiment in the weeding out of inferior species in a stand by girdling was also of interest. The object of the girdling of course, is to cause a slow dying of the inferior or weed species, thus reducing the possibilities of active sprout growth such as often results when the weed trees are cut to the ground. The girdling process also brings about a gradual, rather than an abrupt releasing of the understory, in this case red pine.

WEEVIL DAMAGE:

The activities of the so-called white-pine weevil were in evidence not only in the plantations of white pine, but in plantings of Scotch pine and red pine as well.

In the case of white pine, the effect of shading in practically eliminating the weevil, was in evidence where a stand of white pine had been overtopped by gray birch. In this particular instance, however, it was pointed out that unless the birch was removed immediately, the effect upon the young pine would be even more disastrous than that of the weevil, since it would ultimately result in the complete killing of the understory of white pine. In other words, the question in this case was one of the choice of two evils. Somewhere, there may be a happy medium which will provide just the correct proportion of shade to control the weevil, without injury to the pine by overtopping.

"STAG HEAD" IN RED PINE:

A newly discovered injury to red pine of dangerous possibilities is apparently present over an extensive portion of the plantations of this species in this particular area. The cause, whatever it may be, has resulted in a decided stunting of the growth of the trees. There is a possible relationship between the disturbance and the presence of sweet fern. It may result from poor soil or unfavorable conditions of soil or air drainage or both. Much interest was expressed in this injury, particularly by the representatives of those States, where for one reason or another, unusual reliance has been placed in the use of red pine for reforestation purposes. The entire subject of this particular injury requires a vast amount of further investigation, before any conclusions can be reached.

At the conclusion of the tour through these interesting plantations, the conference adjourned, without form.

C. C. Perry, Secretary

GROWTH OF WHITE PINE

ON THE WOODLOT BELONGING TO MR. BERT STARBUCK

CHESTERTOWN, WARREN CO., N.Y.

By A.E. Fivaz, Forester
Division of Blister Rust Control

On May 2, 1922 Mr. G. H. Collingwood, then on the Cornell forestry faculty, examined the woodlot belonging to Mr. Bert Starbuck in Chestertown, N.Y. and measured the trees on two small sample plots. In a typed report completed apparently in July, 1922, Mr. Collingwood described the tract, listed the data taken on the sample plots, and made recommendations for the management of the area.

In October, 1929 the writer remeasured the trees on the sample plots laid out by Mr. Collingwood, in order to have up-to-date growth and volume data on the woodlot to present to the Fifteenth Annual Blister Rust Control Conference, which inspected the area on November 2, 1929. The following report includes both the 1922 and the 1929 measurements, as well as a discussion of the growth of white pine on the sample plots during the eight growing seasons, 1922-1929, inclusive.

PROCEDURE

Calipers were used in measuring the trees in 1929, and the diameter figure given is the average of the minimum and maximum diameter of each tree, to the nearest tenth of a foot. The heights were estimated by comparison with the height of a measured tree on the plot, and are given herein only as an average for each plot. Volumes were computed from the table for white pine in southern New Hampshire (Table 12, P. 124, The Woodsman's Handbook). The summary of 1922 data has been changed somewhat as a result of the correction of minor errors.

SAMPLE PLOT #1

This plot is situated in an area that was cut over about 1904 or 1905, when all merchantable material was removed (Collingwood). In 1929 the white pines on this plot ranged from 60 to 80 feet in height; one 12-inch tree was measured and found to be 72 feet high; the other heights were estimated. The tree data taken on this 1/10 acre plot are given in Table 1.

TABLE 1. Tree data taken on sample plot #1, Bert Starbuck Woodlot, Chestertown, Warren Co., N.Y.

Tree No.	Species:	1922(May)	1929(Oct.)	Total Change	Average Annual Change
		D.B.H.: B.F.Vol.:	D.B.H.: B.F.Vol.:	in D.B.H.:	in D.B.H.:
				(W.Pine):	
23	W. Pine	10.3 85	11.4 126	1.1	0.14
24	"	11.6 125	12.9 180	1.3	0.16
25					
26	W. Pine	12.6 180	14.1 210	1.5	0.19
27	W.Cedar	5.3	5.4		
28	W. Pine*4	12.0 125	13.5 180	1.5	0.19
29	" *4	12.6 180	14.3 210	1.7	0.21
30	"	9.4 69	10.2 102	0.8	0.10
31	"	6.4 23	7.1 39	0.7	0.09
32	"	6.4 23	7.0 39	0.6	0.08
33	W.Cedar	4.1	4.8		
34	W. Pine	9.8 85	12.4 151	2.6	0.33
35	"	10.3 85	10.5 102	0.2	0.03
36	"	16.8 313	18.8 460	2.0	0.25
37	W.Cedar	5.6	5.9		
38	W. Pine	11.1 103	12.0 151	0.9	0.11
39	"	11.1 103	11.4 126	0.3	0.04
40	"	9.5 69	10.5 102	1.0	0.13
41	"	12.9 180	14.0 210	1.1	0.14
42	W.Cedar	5.9	6.0		
43	W. Pine	9.6 85	10.4 102	0.8	0.10
44	"	9.3 69	9.9 102	0.6	0.08
45	"	14.0 210	16.1 323	2.1	0.26
46	"	5.6 23	dead		
47	"	7.8 53	7.8 53	0.0	0.00
48	"	9.5 69	10.5 102	1.0	0.13
49	"	9.0 69	10.0 102	1.0	0.13
50	W.Cedar	5.6	7.0		
51	Hemlock*1	4.8	5.1		
52	W.Cedar	5.1*2	4.6		
53	W. Pine	6.6 34	7.4 39	0.8	0.10
54	"	7.8 53	9.4 69	1.6	0.20
55	Balsam*3	5.8	6.4		
56	W. Pine	14.3 210	17.6 411	3.3	0.41
57	"	5.5 15	6.1 27	0.6	0.08
58	W.Cedar	6.9	7.1		
A	"		4.5		
B	"		4.0		
C	"		4.1		

Totals white pine -----2,638-----3,718 29.1 -----
Averages per tree (white pine) -----1.164 0.1455

*1 This Hemlock was apparently listed as a white cedar in 1922

*2 This measurement may have been excessive in 1922 through error.

*3 This balsam fir was apparently listed as a white pine in 1922, and the 1922 volume figure for the plot is reduced accordingly by 23 B.F.

*4 Two stems forked from same stump.

The stand on this plot is 67 per cent white pine, 27 per cent white cedar, 3 per cent hemlock, and 3 per cent balsam fir. White pines over 4 inches in diameter occur at the rate of 250 per acre and white cedar at 100 per acre. During the eight growing seasons, 1922 to 1929, the volume of only the white pine on the 1/10 acre plot increased from 2,638 to 3,718 board feet, or at the rate of 1,350 board feet per acre per year. Of the 23 pines on the plot in 1922: 1, or 4 per cent, was dead in 1929; 7, or 27 per cent, had grown less than 1/10 inch in diameter per average year; 12, or 46 per cent, had grown 1/10 inch but less than 2/10 inch per year; 4, or 15 per cent, between 2/10 and 3/10; and one each, or 4 per cent each, between 3/10 and 4/10, and 4/10 and 5/10. With 72 per cent of the 25 pines on the plot in 1929 growing on the average 1/10 inch or more per year, continued increase in the merchantable volume on the plot may be expected without treatment other than the continuation of protection from fire and blister rust. The white cedars on the plot are increasing in diameter at the rate of about 1/20 inch D.B.H. per year, on the average. These trees will supply a number of fence posts when the area is lumbered. Unless economic conditions necessitate the lumbering of this area, it should be left to grow as it is still gaining rapidly in volume and undoubtedly also in quality.

SAMPLE PLOT #2.

This plot is situated in a pure, even-aged stand of white pine seeded naturally on an old field or pasture. One tree blown down during the year was carefully examined and found to be about 53 years old from seed in October, 1929. It was a representative tree and was found to be 71 feet high. Since the sample plot was laid out in 1922, the one white birch then present has been removed, and many of the dead trees have been cut for sugar wood. No evidence was found that living pines have been cut from the plot. The sample plot believed to be 66 feet square was measured and found to be 66x84x73x65, actually containing 0.1170 acre rather than 0.1000 acre as reported in 1932. The tree data are given in Table 2.

TABLE 2. Tree data taken on sample plot #2, Bert Starbuck Woodlot, Chestertown, N.Y.

White Pine No.:	1922 (May)	1929 (Oct.)	Total	Average Annual		
	D.B.H.	B.F.Vol.	D.B.H.	B.F.Vol.	Change in D.B.H.	Change in D.B.H.
59	12.0	125	13.3	180	1.3	0.16
60	5.0	15	died (?) and was cut			
61	4.5	12	4.5	12	0.0	0.00
62	4.3		4.7	15	0.4	0.05
63	6.0	27	6.8	44	0.8	0.10
64	5.8	23	-----dead-----			
65	5.5	15	6.7	44	1.2	0.15
66	6.3	27	6.8	44	0.5	0.06
67	5.8	23	6.5	29	0.7	0.09
68	8.5	62	9.5	81	1.0	0.13
69	11.1	102	12.8	180	1.7	0.21
70	12.8	148	14.9	241	2.1	0.26
71	5.3	15	5.6	29	0.3	0.04
72	6.6	39	6.9	44	0.3	0.04
73	5.4	15	6.1	29	0.7	0.09
74	9.4	69	10.7	126	1.3	0.16
75	6.8	39	8.1	62	1.3	0.16
76	5.3	15	-----dead-----			
77*1	5.4	15	5.6	29	0.2	0.03
78*1	5.4	15	6.0	29	0.6	0.08
79	9.1	69	10.1	102	1.0	0.13
80	5.3	15	5.6	29	0.3	0.04
81	11.0	103	12.9	180	1.9	0.24
82	6.1	27	6.4	29	0.3	0.04
83	7.8	53	8.8	81	1.0	0.13
84	4.0		died(?) and was cut			
85	5.5	15	-----dead-----			
86a	6.3	27	6.5	29	0.2	0.03
86b	5.8	23	died(?) and was cut			
87	5.8	23	died(?) and was cut			
88	9.1	69	11.1	126	2.0	0.25
89	5.3	15	5.4	15	0.1	0.01
90	5.3	15	5.5	15	0.2	0.03
91	6.8	39	7.8	62	1.0	0.13
92	6.3	27	6.5	29	0.2	0.03
93	6.0	27	6.4	29	0.4	0.05
94	7.0	39	died(?) and was cut			
95*2	9.3		-----was cut-----			
96	5.1	15	5.5	15	0.4	0.05
97	6.9	39	8.4	62	0.5	0.06
98	6.5	27	7.4	44	0.9	0.11
99	5.3	15	5.6	29	0.3	0.04

TABLE 2. Cont.

100	6.8	39	8.5	81	1.7	0.21
101	8.4	53	9.4	81	1.0	0.13
102	5.0	15	5.3	15	0.3	0.04
103	6.3	27	7.0	44	0.7	0.09
104	5.8	23	6.3	29	0.5	0.06
105	7.0	39	8.0	62	1.0	0.13
106	4.8	12	5.0	15	0.2	0.03
107	6.0	27	6.6	44	0.6	0.08
108	9.6	85	11.1	126	1.5	0.19
109	6.4	27	7.2	44	0.8	0.10
110	7.0	39	8.6	81	1.6	0.20
111	4.5	12	4.6	15	0.1	0.01
112	6.9	39	8.0	62	1.1	0.14
113	6.8	39	7.4	44	0.6	0.08
114	10.1	85	11.8	151	1.7	0.21
115	5.4	15	5.9	29	0.5	0.06
116	8.0	53	8.8	81	0.8	0.10
117	5.5	15	6.1	29	0.6	0.08
118	6.9	39	7.9	62	1.0	0.13
119	6.4	27	6.9	44	0.5	0.06
120	4.5	12	----dead-----			
121	5.8	15	----dead-----			
122	6.1	27	7.2	44	1.1	0.14
123	2.8	53	8.4	62	0.6	0.08
124	8.8	69	10.8	126	2.0	0.25
125	4.8	15	5.3	15	0.5	0.06
126	4.5	12	4.5	12	0.0	0.00
127	5.3	15	5.6	29	0.3	0.04
128	8.3	53	10.0	102	1.7	0.21
129	4.8	15	died(?)and was cut			
130	3.8		----dead-----			
131	5.4	15	6.0	29	0.6	0.08
132	10.5	85	12.2	151	1.7	0.21
133	5.5	15	5.8	29	0.3	0.04
134	5.9	27	died(?)and was cut			
135	6.9	39	8.0	62	1.1	0.14
136	10.4	85	13.2	180	2.8	0.35
137	7.1	39	8.3	62	1.2	0.15
138	4.5	12	died(?)and was cut			
139	7.0	39	8.1	62	1.1	0.14
140	5.5	15	5.6	29	0.1	0.01
141	5.8	23	---blown down-----			
142	6.4	27	7.1	44	0.7	0.09
143	5.5	15	----dead-----			
144	5.8	23	6.2	29	0.4	0.05
145	6.5	27	----dead-----			
146	5.8	23	6.3	29	0.5	0.06

TABLE 2. Cont.

147	6.3	27	6.9	44	0.6	0.08
148	10.0	85	11.6	151	1.6	0.20
A*3	(5.0)	(15)	5.3	15	(0.3)	(0.04)
Totals	-----3,120-----		-----4,539-----		61.1-----	
Averages per tree	-----		-----		-0.826 0.1032	

*1 Forked from same stump.

*2 White birch.

*3 Apparently omitted in 1922 work; 1922 D.B.H. estimated, and total volume on plot increased by 15 B.F.

On a per-acre basis, the number of white pines dropped from 778 in 1922 to 632 in 1929, a loss of 146 individuals per acre almost entirely because of competition. The average change in diameter of the remaining trees during the eight-year period was 0.826 inch per tree, or 0.1032 inch per tree per year. Average height increased about 10 feet during the period. In 1922, 20 of the pines on the plot, or 22 per cent of the trees then living, were classed as 8 inches or more in diameter (7.6 inches and over). In 1929, 30 of the pines, or nearly 41 per cent of the remaining trees, had reached or exceeded this size (Table 3).

TABLE 3. The number of white pines by diameter classes on sample plot #2 in 1922 and 1929.

D.B.H. Class : Number of Trees in		
	: 1922	: 1929
4	8	2
5	25	9
6	24	20
7	14	13
8	6	10
9	5	6
10	5	2
11	2	4
12	1	3
13	1	4
14	0	0
15	0	1
Total	91	74

On a per-acre basis, the volume of this stand was 26,667 board feet in 1922 and 38,795 in 1929, an increase of 12,128 board feet in eight growing seasons, or 1,516 board feet per acre per year during this period. The average growth of the stand from seed to October, 1929, was 732 board feet per acre per year. This figure is increasing rapidly, however, since it was but 556 in May, 1922.

Of the 91 white pines living in May, 1922 on this plot: 1, or 1 per cent, was windthrown; 16, or 18 per cent died as the result of competition; 41, or 45 per cent have grown less than 1/10 inch in D.B.H. annually during the period 1922-1929; 21, or 23 per cent, have grown between 1/10 and 2/10 inch per year; 11 or 12 per cent between 2/10 and 3/10 inch per year; and 1, or 1 per cent, has grown between 3/10 and 4/10 inch annually. It is evident that the density of the stand has been too great to permit maximum diameter growth. The stand has been decidedly overstocked from the beginning, and in 1929 was still 50 per cent above normal stocking for this age and site. While this condition will continue to keep down volume growth, it is much too late to attempt to correct it. Many of the crowns are small, the boles are slender, and the root systems are undoubtedly restricted in size. A thinning might mean a slow recovery of some intermediate crowns, but it would open the stand to considerable danger of windthrow and whipping damage. While the relatively slow increase in diameter will result in a lower volume than is obtained from less heavily stocked stands in a given number of years, the decrease in volume will be partly made up by an increase in quality of wood. Close-grained white pine is in demand for special uses such as for match stock, and when this stand is eventually lumbered, a special market requiring close-grained pine should be sought for the logs.

Washington, D. C.

May 14, 1931.

REPORT OF THE RESOLUTIONS COMMITTEE

Annual Blister-Rust Control Conference
Warrensburg, New York
October 31 - November 2, 1929

Your committee on Resolutions recommends the following:

WHEREAS the members of this conference have suffered an irreparable loss as a result of the sudden death of Dr. L. H. Pennington and Dean Franklin F. Moon,

BE IT RESOLVED, that the Secretary of the conference be instructed (a) to express to Mrs. Pennington, the sympathy of the members in the passing of Dr. Pennington, our beloved friend and enthusiastic co-worker; and (b) to express to Mrs. Moon our sympathy in the passing of Dean Moon, an enthusiastic friend of forestry and a helpful supporter of the blister-rust control program.

WHEREAS the success of the conference has been due in the first instance to the kindness of Dr. W. A. Taylor, Chief of the Bureau of Plant Industry in approving authorizations for attendance at the conference;

BE IT RESOLVED, that the Secretary of the conference be instructed to express to Dr. Taylor our appreciation of his cooperation and interest.

WHEREAS Messrs. Howard and McIntyre have spent much time in preliminary planning of the program for the conference, including the detailed arrangements for the field trips;

BE IT RESOLVED that the Secretary be instructed to express to the New York Conservation Department our appreciation of the splendid assistance rendered by Messrs. Howard and McIntyre.

WHEREAS our leader Mr. S. B. Detwiler has been unable to meet with us in the recent months;

BE IT RESOLVED that the Secretary be instructed to convey to Mr. Detwiler our commendation for his untiring efforts through the years to make possible the blister-rust control program now in effect; and to express to him the hope that his health will continue to improve.

WHEREAS the members of the conference have profited greatly by a number of the features on the program;

BE IT RESOLVED that the Secretary be instructed (a) to express to A. E. Fivaz our appreciation of his description of some of the results of his investigations on the ecology of Ribes and for his general assistance in carrying out the details in the arrangements for the field trips; (b) to express to A. C. Cline, Assistant Director of the Harvard Forest our appreciation of his splendid contribution to the program by his illustrated talk on pruning and weeding; (c) to convey to H. E. Allanson, Assistant Chief of the Bureau of Plant Industry, our appreciation of his interest in attending the conference, and to thank him for his frank talk on the general subject of administrative relations; and (d) to express to Dr. E. W. Brandes of the Bureau of Plant Industry our appreciation of his willingness to lend his personal films relative to his recent trip in Borneo.

WHEREAS one of the enjoyable features of the program has been the visit to the Pack Demonstration Forest;

BE IT RESOLVED, that the Secretary express to Dean N. C. Brown, Acting Dean of the New York State College of Forestry, our appreciation of the hospitality extended to us at the Pack Forest; for the use of the Administration Building; and for Mr. Foster's assistance in showing us some of the points of interest on this tract.

WHEREAS it is the opinion of the conference that the success of the effort to prevent the further spread of the blister rust depends largely on the continuance of Federal cooperation in the project;

BE IT RESOLVED, that this conference go on record as urging a continuance of Federal participation in the control program in cooperation with the States concerned, and that the Committee of State Cooperators be urged to express this opinion to the Secretary of Agriculture in Washington at the earliest possible date.

WHEREAS the proprietors of the New Adirondack Hotel have made a very special effort to provide the conferees with the best of service;

BE IT RESOLVED, that the Secretary be instructed to write to the O'Connor Brothers, and to express our appreciation of their hospitality and the services rendered by their employees during our stay in Warrensburg.

WHEREAS a number of our valued friends and associates have been unable to attend the conference;

BE IT RESOLVED, that the Secretary be instructed to write to Dr. Haven Metcalf, Chief of the Office of Forest Pathology, and to Agents Bradder, Harpp, Hodgkins, Lambert, Ninman, and Rose, expressing our regret at their inability to be present at this year's conference.

Respectfully submitted,

J. H. Foster, Chairman
W. J. Endersbee
E. C. Mandenberg

Report accepted and resolutions unanimously adopted November 2, 1929.

C. C. Perry, Secretary

CCP:MEC

ATTENDANCE LIST

<u>Name</u>	<u>Address</u>
Adams, M. R.	New Haven, Conn.
Allanson, H. E.	Washington, D. C.
Anderson, O. C.	Syracuse, N. Y.
Baker, F. J.	Keene, N. H.
Barber, P. E.	Saratoga Springs, N. Y.
Barracclough, K. E.	Durham, N. H.
Beardsley, B. A.	Peru, N. Y.
Boomer, S. H.	Conway, N. H.
Rowlby, I. S.	Lowville, N. Y.
Bradbury, H. G.	Belfast, Maine
Brockway, E. M.	North Abington, Mass.
Brown, N. C.	Syracuse, N. Y.
Bullard	Warrensburg, N. Y.
Charlton, J. W.	Gloversville, N. Y.
Clark, E. D.	Torrington, Conn.
Clark, J. C.	Stamford, Conn.
Clave, William	Gardner, Mass.
Cleland, C. H.	Lewis, N. Y.
Clepper, H. E.	Mont Alto, Pa.
Cline, A. C.	Petersham, Mass.
Codman, W. S.	Eldred, N. Y.
Collins, J. F.	Great Barrington, Mass.
Cullen, W. J.	Laconia, N. H.
Curtis, D. S.	North Bridgton, Maine
Detwiler, S. B.	Washington, D. C.
Doore, G. S.	Northampton, Mass.
Dort, Wakefield	Keene, N. H.
Doyle, W. F.	Wilmington, N. Y.
Eaton, F. S.	New Haven, Conn.
Eliason, E. J.	Albany, N. Y.
Endersbee, W. J.	Great Barrington, Mass.
Filler, E. C.	Boston, Mass.
Filley, W. O.	New Haven, Conn.
Fivaz, A. E.	Warrensburg, N. Y.
Foster, Clifford	Warrensburg, N. Y.
Foster, J. H.	Concord, N. H.
Frost, W. O.	Augusta, Maine
Hastings, Smith	Bolton, N. Y.
Hirt, R. R.	Syracuse, N. Y.
Holcomb, H. W.	Peru, N. Y.
Howard, W. G.	Albany, N. Y.
Hurford, A. W.	Providence, R. I.
James	Glens Falls, N. Y.
Kane, T. L.	Woodsville, N. H.

<u>Name</u>	<u>Address</u>
Kennedy, J. D.	Syracuse, N. Y.
Kimball, G. H.	Auburn, Maine
King, T. J.	Concord, N. H.
Littlefield, E. W.	Albany, N. Y.
Luther, Thomas Jr.	Saratoga, N. Y.
Mandenberg, E. C.	Lansing, Mich.
Martin, J. F.	Washington, D. C.
Mathewson, T. G.	Warwick, R. I.
McAveigh, E. F.	, N. Y.
McIntyre, H. L.	Albany, N. Y.
Meier, H. F. A.	Syracuse, N. Y.
Merrill, P. H.	Montpelier, Vt.
Morgan, R. L.	Richmond, N. H.
Mott, P. B.	Trenton, N. J.
Newman, L. E.	Concord, N. H.
Nichols, B. H.	Lewis, N. Y.
Paige, George	Fort Ann, N. Y.
Paige, R. D.	Fort Ann, N. Y.
Peirson, H. B.	Augusta, Maine
Perry, C. C.	Boston, Mass.
Pierce, R. G.	Washington, D. C.
Posey, G. B.	Washington, D. C.
Pratt, W. F.	Saranac Lake, N. Y.
Rex, E. G.	Trenton, N. J.
Richardson, G. F.	Lebanon, N. H.
Richmond, P. B.	Ravena, N. Y.
Riley, J. E.	New Haven, Conn.
Roop, W. T.	Arlington Hts., Mass.
Sheals, R. A.	Washington, D. C.
Snell, W. H.	Providence, R. I.
Spaeth, J. N.	Ithaca, N. Y.
Spaulding, Perley	Amherst, Mass.
Spicer, O. W.	Stamford, Conn.
Stene, A. E.	Kingston, R. I.
Stimson, K. K.	Boston, Mass.
Stouffer, D. J.	Lansing, Mich.
Strait, H. G.	Hyde Park, N. Y.
Swain, L. C.	Exeter, N. H.
Tillotson, C. R.	Amherst, Mass.
Watson, L. N.	Gerrish, N. H.
Welch, D. S.	Ithica, N. Y.
Wheeler, R. E.	West Springfield, Mass.
White, G. E.	Providence, R. I.
White, J. M.	Waterville, Maine
Woodward, E. G.	Warrensburg, N. Y.
York, H. H.	Albany, N. Y.